

Introduction of medical sterilization packaging and research on the performance of non-woven fabrics

1 types of medical sterilization packaging materials

1.1 cotton cloth

Cotton cloth is the traditional [sterile packaging](#) material used in hospitals. Generally, it is necessary to use cotton cloth with a level of 120 yarns or more. In terms of cotton production, there is no uniform standard in the country, and the cotton cloth sold on the market almost does not meet the 120 standards of the relevant specifications. Studies have shown that the first-use medical cotton cloth has a bacteriostatic rate of 48%, and after a series of sterilization and chemical washing, the second-time use rate will suddenly drop to 17%, which is still used. The experimental data made by the highest number of knitted cotton fabrics on the market [1]. China's Ministry of Health stipulates cotton packaging materials and open containers. It is recommended that the storage period below 25 °C is valid for 10 to 14 days, and the number of days should be shortened during wet and rainy seasons.

1.2 Metal or glass hard sterilization box

Metal or glass containers should be self-closing or with venting holes and should be cleaned before use.

1.3 Disposable sterilization packaging [non-woven fabric](#)

Disposable sterilized packaging non-woven fabrics and disposable sterilized packaging crepe papers are gradually replacing traditional cotton woven fabrics as new sterilized packaging materials. It has good gas permeability and facilitates the entry and discharge of sterilization medium; it has good microbial and dust barrier properties. Disposable sterilization packaging non-woven fabric and disposable sterilization packaging wrinkle paper as a new sterilization packaging

material are gradually Instead of traditional cotton cloth. It has good gas permeability, easy to enter and discharge the sterilization medium; has good barrier properties of microorganisms and dust.

1.4 Disposable sterilization wrinkle paper

Disposable sterilized packaging crepe paper as a matching packaging material for disposable sterilized packaging non-woven fabrics, is required to meet the requirements of the above sterilized packaging non-woven fabric. Compared with non-woven fabrics, it has better breathability and moisture permeability, and post-treatment is simpler.

1.5 Disposable sterilization packaging paper and plastic bags

2 Types of non-woven fabric

2.1 According to the use, it can be roughly divided into three types: ordinary non-woven fabric, non-woven fabric for sterilization packaging, and composite non-woven fabric. Ordinary non-woven fabric has no microbial shielding layer and does not have anti-bacterial property; composite non-woven fabric is compounded with high-barrier and waterproof materials such as film, mainly for waterproofing, poor gas permeability, and generally used for medical sheets and the like. The sterilized packaging non-woven fabric is a non-woven fabric with a special microbial barrier layer, which has good tear resistance, tensile and abrasion resistance, and has good microbial barrier properties and dust barrier properties.

2.2 According to the chemical composition, it is divided into all-plastic non-woven fabric (PP non-woven fabric) and non-woven fabric containing plant fiber. PP non-woven fabric can be used for low-temperature plasma sterilization of hydrogen peroxide. Plant fiber-containing plant fiber nonwoven fabric has better gas permeability and moisture-proof performance than PP non-woven fabric.

2.3 According to the melt-blown production process of the microbial barrier layer, it is divided into SMS three-layer non-woven fabric and SMMMS five-layer non-woven fabric. SMMMS nonwovens have a

more uniform microbial barrier layer, higher hydrostatic resistance, better softness and greater tear resistance than SMS nonwovens.

3 non-woven bacteria inhibition principle

The bacteriostasis of the gas permeable packaging material is controlled by the size of the pore size, and also by multi-layer filtration to achieve the effect of bacteriostatic. The non-woven fabric passes through the microscopic shielding layer (M layer), and the numerous fine fibers are irregularly criss-crossed to form small holes with an equivalent pore diameter of less than 50um, thereby achieving the function of bacteriostatic and gas permeable, which can block microorganisms and dust, and is easy to extinguish. Penetration of bacterial media.

1. Changes in performance before and after sterilization

The sterilized packaging non-woven fabric is processed by high-temperature polypropylene through a melt-blown process through multiple processes, and the microstructure is a fine plastic fiber. Shrinkage is the characteristic of plastic articles after encountering high temperature. Plastics that are really resistant to high temperature are not available. High temperature resistance is also a relative concept. Therefore, the non-woven fabric will also have corresponding shrinkage reflection at the microscopic level. After high temperature sterilization, the microscopic fine plastic fibers of the non-woven fabric will shrink to a certain extent. The use of the non-woven fabric after sterilization is more brittle than before sterilization. After testing, the relative concept is tested, so there is no The woven fabric also has a corresponding shrinkage reflection at the microscopic level. After high temperature sterilization, the microscopic fine plastic fibers of the non-woven fabric will shrink to a certain extent. The use of the non-woven fabric after sterilization is more brittle than before sterilization, after testing.

1. Introduction to problems in hospital use

5.1 wet package

First: the instrument is not completely dry after cleaning, there is water before packaging. The device needs to be thoroughly dried before packaging.

Second: the steam humidity of the sterilizer is too large. Third: insufficient drying time after sterilization. Fourth: The sterilizer removes the sterilization package immediately after opening, and the condensed water generated is not removed after the sterilization package is cooled.

The non-woven fabric is easy to be wet in the international arena, and it is also a common problem: the hospital is randomly placed when using non-woven packaging containers, so that there will be a product in the container with the mouth facing upwards. water. The disinfection technical specification clearly stipulates that the container mouth should be tilted downwards. After sterilization, there is obvious water droplets outside the bag. This is the sterilizer and the condensed water droplets on the rack. It has nothing to do with the wet bag. It will be dried in the pan.

5.2 Melting

Some hospitals have reflected that our non-woven fabrics have melted after high-pressure steam sterilization. It has been verified by experiments that the melting point of non-woven fabrics is above 150 °C, and there will be shrinkage near 150 °C, but it will not melt. Melting is caused by the unreasonable sterilization of the fashion pot and the contact of the package with the wall of the pot.

5.3 Damage

The anti-wear and tear resistance of non-woven fabrics must not catch up with cotton cloth. The tear resistance of each packaging material is certain. The same is true for cotton cloth. Too much force and unreasonable handling method will be applied to it. Packaging materials cause damaging damage.

For such damage, it should be prevented and avoided during use. Any instrument boxes, instrument frames and large-quality packages

that are packaged should avoid dragging during pick-and-place and transport, and gently handle them. Guarantee the integrity of the packaging.

1. **Disposable medical sterilization packaging materials have many advantages over traditional cotton cloth**

As a new sterilization packaging material, medical sterilization packaging non-woven fabric is gradually replacing traditional cotton cloth as a new choice for sterilization packaging. It is accepted by hospital disinfection supply center with excellent antibacterial performance and low chipping performance. In terms of cost, there are many articles that have been researched to prove that disposable sterilization packaging materials are more cost-effective for regular hospitals. Compared with traditional cotton cloth, it saves costs such as cleaning, ironing, labor, and wastewater treatment. It reduces the incalculable medical loss brought to the hospital by cross-infection in hospitals. Compared with the cost of integrated cotton cloth, disposable sterilization packaging materials are more economical and practical.